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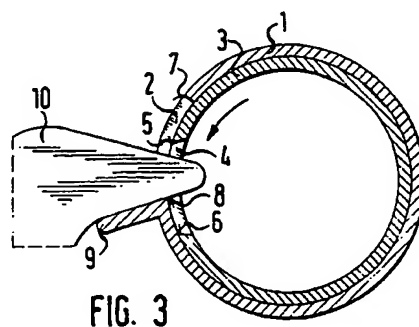
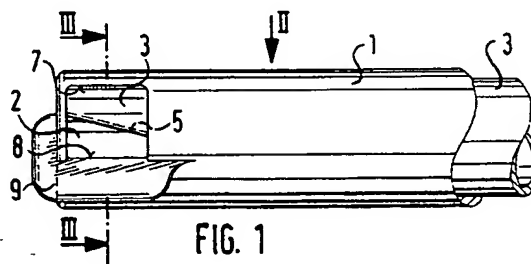
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Selected US specifications from IPC sub-class

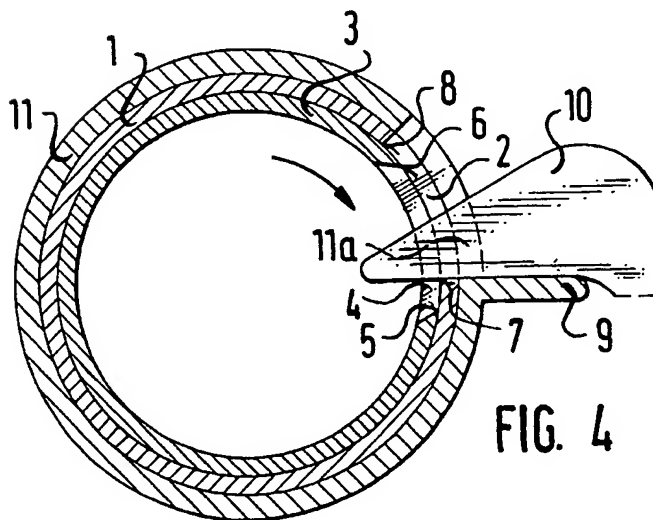
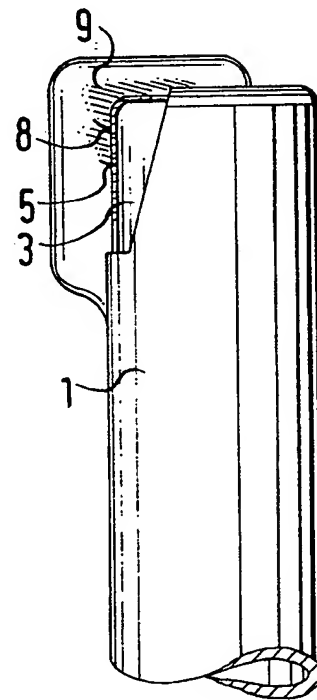
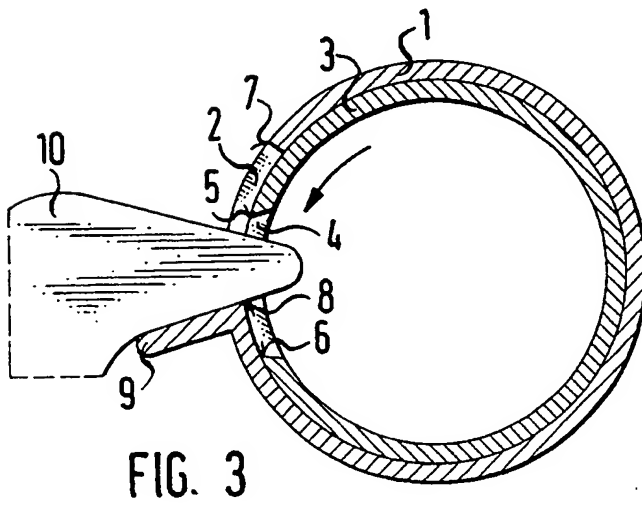
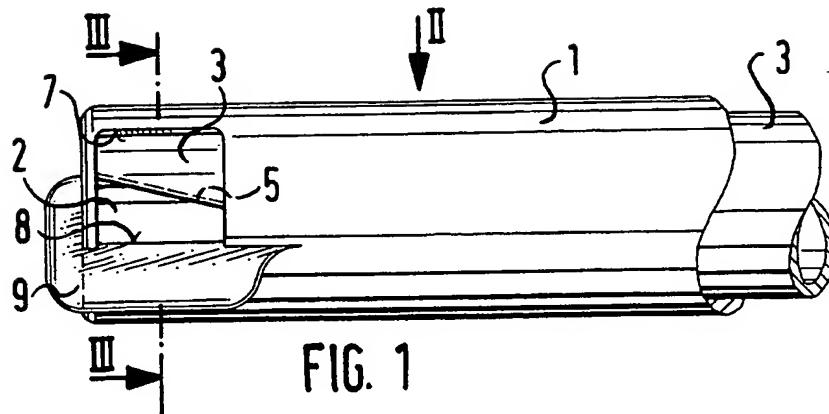
A61B

(54) **An instrument for the surgical treatment of pieces of tissue**

(57) An instrument for the surgical treatment of pieces of tissue such as meniscus of a knee joint of a patient has an outer shaft (1) and an inner shaft (3) mounted drivably for rotation therein with the distal end region of the shafts (1 and 3) having respective cutouts (2 and 4) with respective cutting edges (7, 8 and 5, 6) and there being provided in the region of the cutouts (2 and 4) and transversely to the direction of rotation of the inner shaft (3) a fixed supporting ledge (9) having an outwardly directed supporting surface which grips or projects under or supports the piece of tissue or meniscus (10) that is to be surgically removed.



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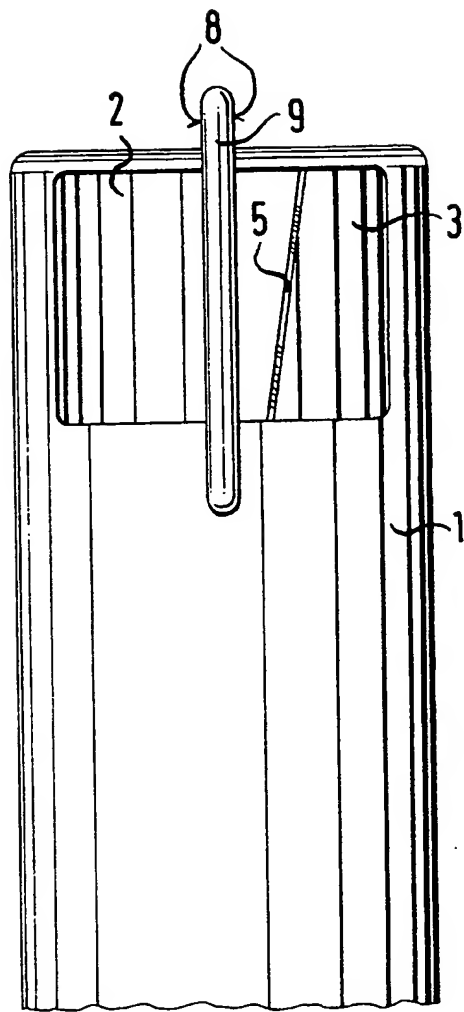


FIG. 5

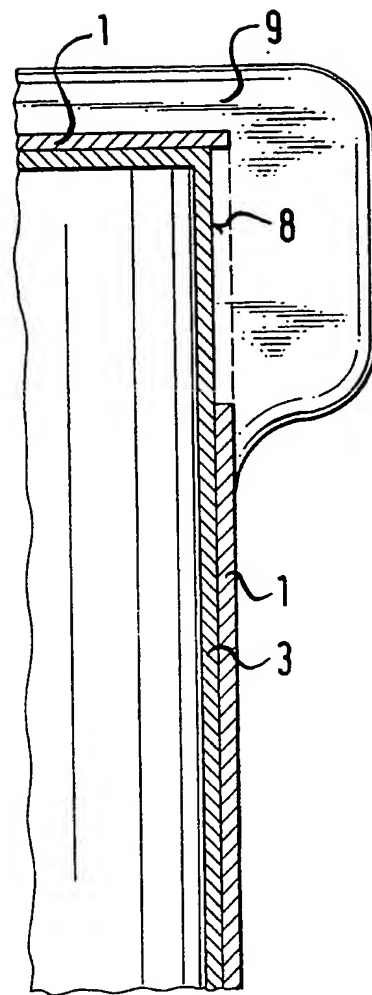


FIG. 6

-1-

"AN INSTRUMENT FOR THE SURGICAL TREATMENT OF
PIECES OF TISSUE"

1 This invention relates to an instrument for the
surgical treatment of pieces of tissue, more
particularly of the meniscus in knee joints, of the
type comprising an outer shaft having an inner
5 shaft mounted drivably for rotation therein with
said shafts being provided at the distal end with
cutouts of which the edges form cutting edges and
counter cutting edges.

Instruments of the aforementioned type are so
10 designed that in operation cartilage and/or pieces
of tissue are gradually removed by the cutting edges
and counter cutting edges. In this respect, for the
surgical treatment the shafts have to have very thin-
walls, and thereby also the width of the recesses
15 in the cutting edge region have to be small, so that
the cutting-edge region can slip off the tissue
surfaces that are being treated. This results in a
surgical treatment by removal of pieces of tissue or
of cartilage being made more difficult or at least
20 unnecessarily prolonged, which severely burdens
the patient.

Accordingly the main object of the present invention
is to avoid or substantially reduce slipping-off of the
cutting-edge region from the surfaces of the cartilage
25 or tissues in particular the meniscus undergoing
surgical treatment with an instrument of the type
referred to hereinabove.

To this end the present invention consists in an

1 instrument for the surgical treatment of pieces of
tissue, such as a meniscus in a knee joint, of a
patient, said instrument comprising an outer shaft and
an inner shaft which is mounted drivably for rotation
5 therein, said shafts being both provided at the distal
end with cutouts of which the edges form cutting edges
and counter cutting edges, characterised in that
provided in the region of the shaft cutouts is a
ledge which is fixed transversely to the direction of
10 rotation of the inner shaft and which has an outwardly
directed supporting surface which supports, projects
or grips under the piece of tissue that is to be
surgically removed.

By means of the invention, the instrument
15 can be so guided that the supporting ledge arrives
with the supporting surface under the piece of
tissue or piece of meniscus that is to be removed,
wherewith the supporting ledge forms a support of
the piece of tissue or piece of meniscus that is to
20 be removed or respectively to be trimmed, in which
respect the pieces that are to be removed also arrive
between the co-operating cutting edges of the inner
and outer shaft. Because of the supporting ledge,
the surface of which may be arbitrarily profiled
25 or roughened, the result is also achieved that, after
the cutting-off the pieces arriving between the shaft
cutting edges, the tissue or the meniscus remains in
the necessary treatment position.

The supporting ledge makes possible a
30 surgical operation which is safe, simple and can be

1 carried out rapidly, with minimum burdening of the patient.

In order that the invention may be more readily understood, some embodiments thereof will now be
5 described by way of example with reference to the accompanying drawings in which:-

Figure 1 is a side elevation of the distal end region of an instrument for the surgical treatment of pieces of tissue and showing shaft cutouts,

10 Figure 2 is a side elevation of the distal end region of the instrument, looking in the direction of the arrow II of Figure 1,

Figure 3 is a cross-section taken along the line III-III of Figure 1,

15 Figure 4 is a cross-section through the same region as Figure 3, but of another embodiment having an additional outer shaft,

Figure 5 is a top plan view of the distal end of another embodiment which is a modification of
20 Figure 1, and

Figure 6 is a side elevation of the embodiment of Figure 5.

An instrument for the removal of pieces of tissue such as meniscii comprises a handle (not shown)
25 to which an outer shaft 1 having a distal cutout 2 is connected so as to be easily releasable and exchangeable. Mounted in the outer shaft 1 is an inner shaft 3 which is rotatable by a drive by way

1 of the handle and which is likewise exchangeable and which is provided with a distal cutout 4. The edges of the cutout 4 form movable cutting edges 5 and 6 and those of the cutout 2 form fixed cutting edges 7 and 8,

The outer shaft 1 is provided with an outwardly extending supporting ledge or projection 9 which may be radial or is advantageously at an angle to the radius, from the cutting edge 8 towards the direction of rotation of the inner shaft 3. Advantageously the supporting ledge 9 extends axially over the length of the cutouts 2 and 4 and is rounded-off over the distal front end of the outer shaft 1, as will be apparent from Figure 2. If the direction of rotation of the inner shaft 3 is reversed, an outer shaft 1 is used in which the supporting ledge 9 projects from the cutting edge 7.

The instrument is so manipulated that the supporting ledge 9 engages e.g. under the meniscus 10 of a knee joint, in which respect pieces of the meniscus pass into the region of the cutting edges 5, 6 and of the counter cutting edges 7, 8 and are cut off by the drive of the inner shaft 3. In this respect, the supporting ledge 9 may be flat or arbitrarily profiled in design and can also be roughened in design on the surface which supports the meniscus 10.

In the embodiment of Figure 4, the direction of rotation of the inner shaft 3 relative to the outer shaft 1 is reversed with respect to that of the embodiment of Figure 2. In addition, there is provided

1 on the outer shaft 1 a further exchangeable
surrounding shaft 11 having a cutout 11a and a radial
or angular supporting ledge 9. The shaft 11 extends
as far as the proximal end of the outer shaft 1 and
5 is connectable to this in known manner, e.g. by a
bayonet catch. Also in this case the tissue that
is to be removed or a meniscus is undergripped
and supported by the supporting ledge 9 and a
supporting of the tissue or of the meniscus remains
10 even after cutting off of pieces of tissue or
meniscus.

In the embodiment of Figures 1 and 3 the
procedure can also in accordance with Figures 5 and
6 be such that the supporting ledge 9 engages in the
15 central longitudinal direction over the cutout 2
of the outer shaft 1, so that the ledge 9 both upon
rotation of the inner shaft 3 clockwise and anti-
clockwise forms a support for the tissue or the like
that is to be removed. In this respect the inner
20 edge 8 of the ledge 9 is in both cases the counter
cutting edge to the cutting edges 5 and 6 of
the inner shaft.

In further development of the invention, the
supporting ledge 9 may be fashioned in the form of a
25 bearing surface which is secured only at the proximal
side on an additional outer shaft and the essential
length of which projects beyond the frontal end of
the additional outer shaft, in order to remove the
supporting ledge if need be by drawing back or by
30 radial rotation from the region of the piece of tissue,

1 cartilage or bone that is to be removed.

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CLAIMS

1 1. An instrument for the surgical treatment of pieces of
tissue, such as a meniscus in a knee joint, of a
patient, said instrument comprising an outer shaft and
an inner shaft which is mounted drivably for rotation
5 therein, said shafts being both provided at the distal
end with cutouts of which the edges form cutting edges
and counter cutting edges, characterised in that
provided in the region of the shaft cutouts is a
ledge which is fixed transversely to the direction of
10 rotation of the inner shaft and which has an outwardly
directed supporting surface which supports, projects
or grips under the piece of tissue that is to be
surgically removed.

2. An instrument according to claim 1, in which
15 the supporting ledge emanates with its
supporting surface from the counter cutting edge,
directed towards the direction of rotation of the
inner shaft, of the outer shaft radially or at an
angle to the radius outwards.

20 3. An instrument according to claim 1, in which
the outer shaft is surrounded by a separate
exchangeable shaft with a distal cutout, and in
which from it the supporting ledge emanates from its
edge, directed towards the direction of rotation of
25 the inner shaft, with its supporting surface radially
or at an angle to the radius outwards.

4. An instrument according to claim 1 or 2, in which
along the or approximately along the central
longitudinal direction of the distal cutout of the
30 outer shaft there extends a supporting ledge with
a radial supporting surface, the inner edge of which

- 1 forms the counter cutting edge to the cutting edges
of an inner shaft rotating clockwise or anticlockwise.
5. An instrument according to any one of claims
1 to 4, in which the supporting ledge has a length
5 which extends over the longitudinal directed length
of the distal lateral cutout of the outer shaft and
over the distal front end of the outer shaft.
6. An instrument according to any one of claims
1 to 5, in which the supporting ledge has a surface
10 which is flat or profiled and the peripheral edge
thereof is atraumatic in design.
7. An instrument according to any one of claims
1 to 6, in which the supporting ledge has a supporting
surface which is rough in design.
- 15 8. An instrument for the surgical treatment of
pieces of tissue substantially as hereinbefore
described with reference to Figures 1 to 3 of the
accompanying drawings.
9. An instrument for the surgical treatment of
20 pieces of tissue substantially as hereinbefore
described with reference to Figure 4 of the accompanying
drawings.
10. An instrument for the surgical treatment of
pieces of tissue substantially as hereinbefore des-
25 cribed with reference to Figures 1 to 3 as modified
by Figures 5 and 6 of the accompanying drawings.